

REMARKS

This Amendment is in response to the Office Action of May 12, 2006. In the Office Action, Claims 1-16 were indicated as pending and rejected. With this Amendment, Claims 1, 2, 8, 9, 11, 12 and 16 are amended, and Claims 1-16 are presented for reconsideration and allowance.

Claim Rejections - 35 USC 112

Claim 11 was rejected under 35 USC 112, second paragraph for lack of antecedent basis. With this Amendment, Claim 11 is amended to depend from Claim 10, as suggested by the Examiner. Withdrawal of the rejection under 35 USC 112, and allowance of amended Claim 11 is therefore requested.

Claim Rejections - 35 USC 102

Claims 1, 2, 4, 12 and 13 were rejected under 35 USC 102(b) over Oweis et al. US 5,651,255.

With this Amendment, Claim 1 is amended to include limitations to a first layer spreading heat flow from a hot spot of an electrical energy storage cell during a short circuit, and a second layer having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere.

With this Amendment, Claim 12 is amended to include limitations to providing an electrical storage cell that comprises a hot spot during a short circuit, covering an outer surface of the cell with a first layer that spreads heat flow from the hot spot, and providing a second layer with an outer surface temperature that is lower than a temperature which can cause combustion in a combustible atmosphere.

Oweis et al. discloses a vacuum insulation structure (column 1, line 12) that is wound around one or more batteries captured in a "sealed, outer metallic container (not shown) put

under high vacuum using a tube thereof (not shown) as a interface with a source of vacuum such as a vacuum pump (not shown).” Oweis, col. 3, lines 15-21. Oweis teaches that the vacuum insulation structure is for a high temperature battery. Oweis col. 1, lines 12-13. Oweis teaches that the vacuum insulation structure “functions to reverberate the heat flux” (Oweis col. 2, lines 30-31). In Oweis, the high vacuum and the vacuum insulation structure are provided in order to reflect heat back to the battery and keep the high temperature battery very hot. The function of Oweis’ metal foil is that of a reflector that concentrates heat. There is no teaching in Oweis that the metal foil spreads heat from a hot spot.

The disclosure of Oweis et al. indicates the presence of a vacuum around the battery, in other words, the absence of a combustible atmosphere around the battery. The disclosure of Oweis indicates multiple layers of foil for reflecting radiation to concentrate heat, in other words there is no disclosure of spreading heat from a hot spot by using such foil.

Oweis et al. is non-analogous art

Oweis et al. is non-analogous art. The battery and insulation structure disclosed in Oweis are arranged to increase a temperature of a high temperature battery. In contrast with Oweis, the invention as presently claimed in Claims 1, 12 has a first thermally conductive layer arranged to lower temperatures by spreading heat flow from a hot spot and has a second thermally insulating layer with an outer surface temperature that is lowered below a combustion temperature. In contrast, the Oweis et al. insulation structure is arranged to operate in a high vacuum where a combustible atmosphere comprising oxygen and fuel is not available to support combustion. The invention as presently claimed in Claims 1 and 12, however, operates in a combustible atmosphere to reduce combustion risks. There is nothing in Oweis et al. that a person skilled in the art would consider as

suggesting the invention as presently claimed in Claims 1 and 12. For these reasons, Oweis et al. is considered non-analogous art. Withdrawal of the rejections of Claims 1, 2, 4, 12 and 13 under 35 USC 102 and allowance of Claims 1, 2, 4, 12 and 13 are therefore requested.

Elements not disclosed by Oweis et al.

Independent Claims 1 and 12, as presently amended, include limitations to a first layer spreading heat flow from a hot spot. Oweis does not disclose a hot spot on an electrical energy storage cell during a short circuit. Oweis et al. does not disclose a first layer spreading heat flow from a hot spot. For these reasons, Claims 1, 2, 4, 12 and 13 are believed to be novel. Reconsideration of the rejection of Claims 1, 2, 4, 12 and 13 under 35 USC 102, and allowance of Claims 1, 2, 4, 12 and 13 are therefore requested.

Independent Claims 1 and 12, as presently amended, include limitations to a second layer having an outer surface temperature that is below a temperature which can cause combustion in a combustible atmosphere. Oweis et al. does not disclose having an outer surface temperature that is below a temperature which can cause combustion in a combustible atmosphere. For these reasons, Claims 1, 2, 4, 12 and 13 are believed to be novel. Reconsideration of the rejection of Claims 1, 2, 4, 12 and 13 under 35 USC 102, and allowance of Claims 1, 2, 4, 12 and 13 are therefore requested.

Claim Rejections - 35 USC 103

Claims 1, 2, 7 and 12 were rejected under 35 USC 103(a) over Lee et al. US 6,294,287 in view of Moores et al. US 6,455,186.

With this Amendment, Claims 1 and 12 are amended to include limitations to a first layer spreading heat flow from a hot spot on an electrical energy storage cell during a short

circuit, and a second layer having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere.

Lee et al. teaches insulation "that increases the internal temperature of the cell during discharge, resulting in better performance." Lee, abstract, lines 8-10. Moores et al. teaches a conductive layer and a heat sink for removing heat from cells.

Neither Lee et al. nor Moores et al., taken singly or in combination, teach or suggest providing an electrical energy storage cell comprising a hot spot during a short circuit as presently claimed in Claim 12. Neither Lee et al. nor Moores et al., taken singly or in combination, teach or suggest a first layer spreading heat flow from a hot spot on a cell during a short circuit as presently claimed in Claims 1 and 12. Neither Lee et al. nor Moores et al., taken singly or in combination, teach or suggest providing a thermally insulating layer having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere as presently Claimed in Claims 1 and 12.

There is no motivation to combine Lee et al. and Moores et al. Lee et al. teaches an insulation arrangement for increasing the internal temperature of a cell (Lee et al. abstract, lines 7-9. Moores et al., on the other hand, teaches arrangement with a fan for cooling (decreasing the temperature of) a battery pack. The objective of Lee et al. is opposite to and incompatible with the objective of Moores et al. Furthermore, neither Lee et al. nor Moores et al. address lowering an outer surface temperature below a temperature which can cause combustion in a combustible atmosphere as presently claimed in Claims 1, 2, 7 and 12.

For these reasons, Claims 1, 2, 7 and 12 are believed to be not obvious over a combination of Lee et al. and Moores et

al. Withdrawal of the rejection and reconsideration and allowance of Claims 1, 2, 7 and 12 are therefore requested.

Claim 3 was rejected under 35 USC 103(a) over Oweis et al. US 5,651,255 in view of Rouillard et al. US 6,087,036.

As discussed above in connection with the rejection under 35 USC 102, Oweis et al. is non-analogous art, and also does not teach an electrical energy storage cell comprising a hot spot during a short circuit, and does not teach a second layer with an outer surface temperature that is lowered below a temperature which can cause combustion in a combustible atmosphere. Rouillard et al. does not teach a first layer spreading heat from a hot spot during a short circuit as presently claimed in amended Claim 1. Rouillard et al. does not teach an outer surface temperature that is lowered below a temperature which can cause combustion in a combustible atmosphere as presently claimed in amended Claim 1. Neither Oweis et al. nor Rouillard et al. teach or suggest a hot spot. Neither Oweis et al. nor Rouillard et al. teach or suggest a combustible atmosphere.

Neither Oweis et al. nor Rouillard et al., taken singly or in combination, teach or suggest the limitations of Claim 1 from which Claim 3 depends. The additional limitation of Claim 3, when taken in combination with the limitations of Claim 1 is also believed to be not obvious and patentable. Withdrawal of the rejection, and reconsideration and allowance of Claim 3 are therefore requested.

Claims 4, 5, 13 and 14 were rejected under 35 USC 103(a) over Lee et al. US 6,294,287 in view of Moores et al. US 6,455,186 (as applied to Claims 1, 2, 7 and 12 above) and further in view of Dansui et al. US 2003/0013009.

As discussed above, base claims 1, 12 include limitations to a first layer spreading heat from a hot spot on an electrical energy storage cell during a short circuit, and a second layer with an outer surface temperature that is lowered below a temperature which can cause combustion in a combustible atmosphere. These limitations are not taught or suggested by Lee et al., Moores et al. or Dansui et al., taken singly or in combination. The additional limitations of Claims 4, 5, 13 and 14, when taken in combination with the respective base claims are also believed to be patentable. Withdrawal of the rejections of Claims 4, 5, 13 and 14, and reconsideration and allowance of Claims 4, 5, 13 and 14 are therefore requested.

Claims 6, 7 and 15 were rejected under 35 USC 103(a) over Lee et al. US 6,294,287 in view of Moores et al. US 6,455,186 (as applied to Claims 1, 2, 7 and 12 above) and further in view of Oosaki et al. US 5,689,173.

Neither Lee et al. nor Moores et al., taken singly or in combination, teach or suggest a first layer spreading heat flow from a hot spot on an electrical energy storage cell during a short circuit as presently claimed in Claims 1 and 12. Neither Lee et al. nor Moores et al., taken singly or in combination, teach or suggest providing a thermally insulating layer having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere. The additional limitations of Claims 6, 7 and 15, when taken in combination with the respective base claims are also believed to be patentable. Withdrawal of the rejections of Claims 6, 7 and 15, and reconsideration and allowance of Claims 6, 7 and 15 are therefore requested.

Claims 8 and 16 were rejected under 35 USC 103(a) over Lee et al. US 6,294,287 in view of Moores et al. US 6,455,186 (as

applied to Claims 1, 2, 7 and 12 above) and further in view of Bechtold et al. US 6,007,944.

With this Amendment, claims 8 and 16 are amended to include limitations to thermally conductive half shells. Neither Lee et al. nor Moores et al. al nor Bechtold et al., taken singly or in combination, teach or suggest thermally conductive half shells. The limitations of Claims 8 and 16, when taken in combination with the limitations of the respective base claims are believed to be patentable. Withdrawal of the rejection, and reconsideration and allowance of amended Claims 8 and 16 are therefore requested.

Claims 9 and 10 were rejected under 35 USC 103(a) over Miller et al. US 5,204,194 in view of Oweis et al. US 5,651,255. With this Amendment, Claim 9 is amended to include limitations to cells that comprise at least one hot spot during a short circuit, a first layer of thermally conductive material spreading heat flow from the hot spot and a second layer of thermally insulating material that has an outer surface temperature that is lower than a temperature which can cause combustion in a combustible atmosphere.

As discussed above, the Oweis et al. reference does not disclose this combination of limitations. The Miller et al. reference also does not disclose this combination of features. Oweis et al. and Miller et al., taken singly or in combination, do not teach or suggest the combination currently claimed in amended Claim 9. Withdrawal of the rejection and reconsideration and allowance of Claims 9-10 is therefore requested.

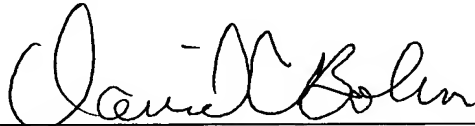
Claims 11 was rejected under 35 USC 103(a) over Miller et al. US 5,204,194 in view of Oweis et al. US 5,651,255 for the reasons stated above. As discussed above, Miller et al., Oweis et al. do not teach or suggest the limitations of Claim 9, 10 as

presently amended. The additional limitations of Claim 11, when taken in combination with the limitations of Claim 9 and 10 are also believed to be patentable. Withdrawal of the rejection and reconsideration and allowance of Claim 11 is therefore requested.

With these amendments, the application appears to be in condition for allowance, and favorable action is requested. The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

David C. Bohn, Reg. No. 32,015
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402
Phone: (612) 334-3222 Fax: (612) 334-3312